



Chemical Propulsion Information Analysis Center

CPIAC

Pete Zeender, Deputy Director
410-992-9950

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Information for the Defense Community **DTIC**[®]

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CPIAC Overview

- **Mission:** Provide rapid, accurate propulsion science and technology information and analysis in support of national aerospace and defense objectives.
- **Scope:** Propulsion system, propellant and energetic material technologies for:
 - Rockets and Missiles
 - Space Systems
 - Gun-launched Munitions

CPIAC's 60+ year heritage has provided a constant supporting presence to the DoD and NASA propulsion community, helping to avoid duplication of R&D and resulting in countless savings to the U.S. Government.



CPIAC Heritage



- ◆ Rocket Propellant Information Agency established at Johns Hopkins Applied Physics Laboratory with Navy and Army sponsors 1946

- ◆ Name changed to Solid Propellant Information Agency 1948

- ◆ Air Force begins sponsorship of SPIA 1951

- ◆ NASA becomes sponsor 1959

- ◆ Interagency Chemical Rocket Propulsion Group (ICRPG) chartered 1962

- ◆ SPIA merged with Liquid Propellant Information Agency to form CPIA in 1962

- ◆ CPIA designated as DoD Information Analysis Center under NAVSEA 1966



- ◆ ICRPG rechartered as JANNAF 1970



- ◆ CPIA relocates to APL's Howard County campus in Laurel, Maryland 1976

- ◆ CPIA moves from APL to current Century Plaza headquarters in Columbia, Maryland 1978



- ◆ DoD Administrative oversight of CPIA transferred to Defense Technical Information Center 1980

- ◆ Operation of CPIA transferred from APL to JHU Whiting School of Engineering 1990

- ◆ JHU marks 50 years of continuous operation of CPIA with award of contract from DSCC 1996

- ◆ Chemical Propulsion Information Analysis Center established with new contract award to JHU 2005

1945 1950 1960 1970 1980 1990 2000 2008



Primary Defense Customers

- **Army Research Laboratory (ARL)**
- **Armament Research, Development & Engineering Center (ARDEC)**
- **Aviation & Missile Research, Development & Engineering Center (AMRDEC)**
- **Army Research Office**

- **Naval Air Warfare Center Weapons Division - China Lake (NAWC/WD)**
- **Naval Surface Warfare Center Indian Head Division (NSWC/IH)**
- **Office of Naval Research (ONR)**

- **Air Force Office of Scientific Research (AFOSR)**
- **Air Force Research Laboratory Space & Missile Propulsion Division**
- **Air Force Research Laboratory Aerospace Propulsion Division**

- **Office of the Director of DoD Research & Engineering (DDR&E),**
- **Department of Defense Explosives Safety Board (DDESB)**
- **Defense Ammunition Center (USADAC)**

And All Major Defense Prime and Propulsion Contractors



CPIAC Supports Major Initiatives

- DoD Space Platforms Technology Area Review & Assessment (TARA)
- U.S. Missile Defense (MDA and SMDC)
- Technology for the Sustainment of Strategic Systems (TSSS)
- DDR&E Energetic Materials Investment Planning
- Integrated High Payoff Rocket Propulsion Technology (IHPRPT) Program
- NASA's Exploration Initiative



CPIAC Supports the JANNAF IPC

JANNAF exists to:

- Promote and facilitate exchange of technical information in a controlled environment (U.S. only)
- Establish and promulgate standards
- Coordinate research and development programs
- Address issues of joint agency interest

12 JANNAF Subcommittees:

- Airbreathing Propulsion
- Combustion
- Exhaust Plume Technology
- Liquid Propulsion
- Modeling and Simulation
- Nondestructive Evaluation
- Propellant and Explosives Development and Characterization
- Propulsion Systems Hazards
- Rocket Nozzle Technology
- Safety and Environmental Protection
- Spacecraft Propulsion
- Structures and Mechanical Behavior

The JANNAF Interagency Propulsion Committee is composed of representatives from the DoD, the military services and NASA



What We Do For JANNAF

- Technical, Administrative and Logistical Support
- Develop and Publish Standards, Guidelines and Specifications
- Maintain and Distribute Performance Simulation Codes
- Host Technical Conferences and Workshops
 - ~Two Conferences per Year (250 to 600 attendees)
 - ~Three to Four Workshops per Year (25 to 75 attendees)
- Publish and Archive Proceedings and Reports

The JANNAF Community is estimated at ~ 4,000 active members



CPIAC Online Information Tools

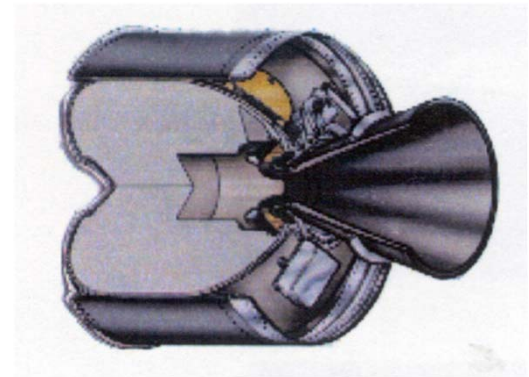
- Suite of Access Controlled/Secure Database Tools
 - Accessible Online via Internet
- STI Library Access Tool (PIRS)
 - 105,000+ Documents
 - 36,000+ Documents Migrated to DTIC TEMS Project
- Rocket Motor Electronic Database (RMED)
- Solid Propellant Database (SPD)
- Propellant & Explosive Ingredients Database (PEID)
- Liquid Propellant Database (LPD)
- Rocket Propulsion Test Facilities (RPTF) Database
- Insensitive Munitions Test Database (*in development*)
- R&D Motor Ingredients Database (*in development*)



Missile Defense Support



- CPIAC conducted an ignition safety assessment for the silo-based Ground-based Interceptor (GBI) Booster.
- CPIAC assisted Arnold Engineering Development Center (AEDC) with acquiring Orion 38 nozzle configuration data necessary to complete an upper stage target simulation analysis for MDA.
- CPIAC researched and provided technical and historical data on the generation of aluminum oxide slag by upper stage rocket motors with partially submerged nozzles for AEDC.





NASA Exploration Initiative

- CPIAC supported the stand-up of the new Solid and Hybrid Propulsion Systems Branch at NASA Marshall Space Flight Center
- CPIAC contributed subject matter expertise and data for design and trade studies on solid boost and crew escape systems
- CPIAC's *Rocket Motor Electronic Database* identified inventory rocket motors to simulate launch loads CLV crew capsule testing.





Tactical Missile Demilitarization

- Tooele Army Depot (TEAD) is the designated DoD demilitarization center for tactical missiles.
- CPIAC has provided technical support for static firing disposal of propellant materials.



- Identification of propellant constituents, consumables, and heavy metals.
- Combustion data for rigid open burning permit process.
- Characterization for Munitions Items Disposition Action System



Operation Iraqi Freedom Support

- CPIAC supported the U.S. Navy Explosive Ordnance Disposal Technical Division in disposal of Soviet Era Iraqi SA-2 missiles
- CPIAC provided:
 - Definitive technical data on liquid propellants for SA-2
 - Expert review of emergency disposal procedures
 - Identification of common dilution solvents for disposal



Propellant
(IRFNA) Vapors





CPIAC Summary

- CPIAC is the oldest IAC in operation (since 1946)
 - We are proud to have contributed to the evolution of every phase of this Nation's space launch and missile capability since WW-II
- CPIAC provides technical data, information and expertise to the rocket, missile and gun propulsion interests of all of the services, DoD components, NASA, and industry contractors
- We support and promote joint service research and development through DTIC, major government initiatives, and the JANNAF IPC - to a community of over 4000 engineers and scientists
- **Our services are available for your use, and we are never further than a phone call, e-mail, or website link away...**



We're Here for You, Put Us to Work

- Inquiries: cpiac@cpiac.jhu.edu
- CPIAC Bi-Monthly Technical Bulletin (Electronic)
 - E-mail Subject = 'Sign Up' to: Bulletin@cpiac.jhu.edu
- Databases: <https://webdatabase.cpia.jhu.edu/>
- Propulsion News: <http://www.cpiac.jhu.edu/>
- CPIAC Website: <http://www.cpiac.jhu.edu/>
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- DTIC IAC Website: <http://iac.dtic.mil/>
- Front Office: 410.992.7300